

I claim:

1. A method of manufacturing microelectronic devices, comprising:
 - providing a photo resist coater tool of the type having a coater plate and a nozzle connected to a fluid flow line, with the nozzle positionable over the coater plate;
 - providing a valve assembly positioned in the flow line to control flow between at least two fluid inputs and the nozzle,
 - positioning a wafer on the coater plate;
 - operating the valve assembly to dispense photo resist from the first of the fluid inputs and through the nozzle onto a wafer;
 - operating the valve assembly to stop the flow of photo resist, and
 - operating the valve assembly to send a solvent from a second of the fluid inputs through the flow line and nozzle to reduce coagulation of the photo resist in or about the nozzle.
2. The method of manufacturing microelectronic devices as in Claim 1 wherein the step of sending solvent through the nozzle includes positioning the nozzle over a solvent drain.
3. The method of manufacturing microelectronic devices as in Claim 1 wherein the step of sending solvent through the nozzle only occurs when the flow of photo resist through the nozzle has ceased for a pre-determined period of time.
4. The method of manufacturing microelectronic devices as in Claim 3 wherein the pre-determined period of time is thirty minutes.
5. The method of manufacturing microelectronic devices as in Claim 3 wherein the pre-determined period of time ranges from fewer than ten minutes to more than sixty minutes.
6. The method of manufacturing microelectronic devices as in Claim 1 wherein the nozzle is permitted to again dispense photo resist prior to sending the solvent through the nozzle.
7. The method of manufacturing microelectronic devices as in Claim 1 further including the step of positioning the nozzle over a solvent drain prior to the step of operating the valve assembly to send a solvent from a second of the fluid inputs through the flow line and nozzle.
8. The method of manufacturing microelectronic devices as in Claim 1 wherein the valve assembly includes a three-way valve.
9. A method of manufacturing microelectronic devices as in Claim 1 wherein the solvent is taken from the group consisting of
 - Propylene Glycol Monomethyl Ether Acetate (PGMEA),
 - Propylene Glycol Monomethyl Ether (PGME),

5 N-butyl Acetate,
6 Acetone,
7 Cyclohexnone,
8 Ethyl Lactate,
9 N-Methyl Pyrrolidone (NMP) (1-methyl, 2-Pyrrolidinone),
10 Tetrahydrofuran (THF),
11 and Methyl Amyl Keytone.

- 1 7. The method of manufacturing microelectronic devices as in Claim 1 where in the step of
2 sending solvent from a second fluid input includes flushing the solvent through the nozzle.
- 1 8. The method of manufacturing microelectronic devices as in Claim 1 further including the
2 step of operating the valve assembly to send photo resist through the nozzle in order to
3 clear the nozzle of solvent prior to again dispensing photo resist.
- 1 9. The method of manufacturing microelectronic devices as in Claim 1 wherein the steps of
2 operating the valve assembly to stop the flow of photo resist and send solvent from a
3 second of the fluid inputs is sequenced with a controller.
- 1 10. The method of manufacturing microelectronic devices as in Claim 2 wherein the step of
2 positioning the nozzle over a solvent drain is performed by rotating the nozzle about an axis
3 to move from a production position over the coater plate to an idle position over the solvent
4 drain.
- 1 11. A method of manufacturing microelectronic devices as in Claim 1 wherein the step of
2 operating the valve assembly to dispense photo resist from the first of the fluid inputs further
3 includes activating a photo resist pump and the step of operating the valve assembly to
4 send solvent from the second of the fluid inputs further includes activating a solvent pump.
- 1 12. A method of manufacturing microelectronic devices as in Claim 11 wherein the photo resist
2 pump and the solvent pump are activated by a pump controller.
- 1 13. A system for dispensing photo resist comprising:
2 a nozzle configured to alternately receive photo resist for delivery on to a plurality of wafers
3 or liquid solvent to prevent coagulation of photo resist in the nozzle when the nozzle is idle;
4 a liquid source of photo resist;
5 a liquid source of solvent;
6 first and second flow lines providing fluid communication from the photo resist source
7 and solvent source;

a valve assembly configured between the nozzle and at least the first and the second flow lines in order to select the movement of fluid from one or another of the flow lines, thereby enabling movement of solvent through the nozzle to flush photo resist therefrom.

14. A system for dispensing photo resist comprising:

a nozzle configured to alternately receive photo resist for delivery on to a plurality of wafers or liquid solvent to prevent coagulation of photo resist in the nozzle when the nozzle is idle;

a liquid source of photo resist;

a liquid source of solvent;

first and second flow lines providing fluid communication from the photo resist source and solvent source;

a valve assembly configured between the nozzle and at least the first and the second flow lines in order to select the movement of fluid from one or another of the flow lines, thereby enabling movement of solvent through the nozzle to flush photo resist therefrom;

a controller configured to operate the valve assembly to: selectively send photo resist to the nozzle for delivery to wafers and, after a pre-determined period of time, send solvent to the nozzle in order to clear photo resist from the nozzle.

15. The system for dispensing photo resist as in Claim 14 wherein the pre-determined period of time ranges from less than 10 minutes to more than 60 minutes.

16. The system for dispensing photo resist as in Claim 14 wherein the pre-determined period of time is 30 minutes.

17. The system for dispensing photo resist as in Claim 14 further including a photo resist pump activated by signals from the controller to a pump controller to send photo resist from the photo resist source through the first flow line and a solvent pump activated by signals from the controller to the pump controller to send solvent from the solvent source through the second flow line.

18. The system for dispensing photo resist as in Claim 13 wherein the valve assembly includes at least two input ports and an output port, the two input ports connected to each of the first and the second flow lines and the output port directing fluid toward the nozzle.

19. The system for dispensing photo resist as in Claim 13 wherein the valve assembly is a three-way valve.

20. The system for dispensing photo resist as in Claim 13 wherein the nozzle is connected to a nozzle positioning mechanism which permits the nozzle to move rotatably about an axis from a production position over a coater plate to an idle position over a solvent drain.